

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re the Application of

Inventor : **John Murkowski et al.**

Application No. : **10/597,536**

Filed : **July 28, 2006**

For : **DIAGNOSTIC ULTRASOUND SYSTEM
WITH ARTICULATING FLAT PANEL
DISPLAY**

APPEAL BRIEF

On Appeal from Group Art Unit 3768
Examiner Hien Ngoc Nguyen

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I. REAL PARTY IN INTEREST

The real party in interest is Koninklijke Philips Electronics N.V., Eindhoven, The Netherlands by virtue of an assignment recorded July 28, 2006 at reel 018018, frame 0520.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

This application was originally filed with Claims 1-20. Claims 2, 5, and 15-20 have been canceled. Claims 1, 3, 4, and 6-14 stand finally rejected by an Office Action mailed February 3, 2010. Claims 1, 3, 4, and 6-14 are the subject of this appeal.

IV. STATUS OF AMENDMENTS

No amendments or other filings were submitted in response to the final rejection mailed February 3, 2010. A notice of appeal was timely filed on April 6, 2010.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

In recent years the CRT display monitors on cart-borne ultrasound systems, the prevalent form in which ultrasound systems are configured,

are being replaced by flat panel displays. Since flat panel displays are much lighter than the heavy glass CRT monitors which preceded them, flat panel displays lend themselves to easier and more versatile adjustment so as to be more comfortable for viewing by the sonographer. To provide high versatility and ease of use, a number of design objectives can be pursued simultaneously. The flat panel display should have a wide range of adjustable positioning for viewing. Its weight should be neutrally offset so that the display is adjustable with the touch of a finger. When the sonographer has adjusted the display to face him or her, the display orientation toward the sonographer should remain constant as the display is subsequently raised or lowered. Finally, the display must be safely and securely stowed whenever the cart-mounted ultrasound system is wheeled to another room or floor of a hospital.

An ultrasound system of the present invention satisfies all of these design objectives. A flat panel display is connected to an articulating arm assembly which enables the display to be adjusted laterally and in elevation. The assembly includes two movable arms, one connected to the cart-borne ultrasound system and the other to the display. One of the arms includes a 4-bar linkage which allows the adjustment of the display up or down while maintaining its tilt toward the sonographer. A piston inside the linkage provides a counter-weight force which offsets most of

the weight of the flat panel display, allowing the display to be easily maneuvered and adjusted by the fingers of the sonographer. The articulating arms have an inter-arm locking mechanism located on the two arm which is adapted to lock the two arms together in a stowed position when the two arms are lowered in line with the direction of travel. In this position the flat panel display is safely locked down on the cart when in the stowed position. Since the arms are lowered in line with the direction of travel, the display is well balanced during transport of the cart. With the articulating arms locked together in their stowed position, the cart can be safely transported without injury to the sonographer or damage to the flat panel display.

Claim 1 is supported by the drawings and specification as seen by reference numerals (#) of the drawings and the specification text (paragraph number) of the published application, US patent pub. No. 2008/0234577, as follows:

1. An ultrasonic diagnostic imaging system comprising:
 - a main body {#12; [0031], Claim 1} housing imaging electronics and a control panel {#18; [0031]} coupled to the imaging electronics;
 - a flat panel display {#40; [0031], Claim 1] electrically coupled to the imaging electronics;
 - a wheeled cart {#14; [0031], Claim 18} on which is mounted the main body and the flat panel display with the control panel on the front, the wheeled cart being adapted so that the cart can travel in the front direction; and
 - an articulating arm assembly to {#50; [0017]} which the flat panel display is connected for adjusting the elevation and lateral position of the

flat panel display with respect to the main body, the articulating arm assembly including a first arm {#52; [0018]} movably mounted to the main body and a second arm {#54; [0019]} movably connected to the first arm and to the flat panel display, wherein at least one of the arms includes a 4-bar linkage {#70; [0020]} containing a piston {#56; {0021]} inside the linkage; and

an inter-arm locking mechanism {#92, #94; [0023]} , located on the first and second arms, which is adapted to lock the two arms together in a stowed position {Fig. 8c; [0027]} when the two arms are lowered in line with the direction of travel.

**VI. GROUNDS OF REJECTION TO BE REVIEWED
ON APPEAL**

A. Whether Claims 1, 3-4, and 7-14 were correctly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. 5,924,988 (Burris et al.) in view of US Pat. 6,663,569 (Wilkins et al.)

B. Whether Claim 6 was correctly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. 5,924,988 (Burris et al.) in view of US Pat. 6,663,569 (Wilkins et al.) and further in view of US Pat. 6,669,639 (Miller et al.)

VII. ARGUMENT

A. Whether Claims 1, 3-4, and 7-14 were correctly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. 5,924,988 (Burris et al.) in view of US Pat. 6,663,569 (Wilkins et al.)

Burris et al. was cited for its showing of two articulated arms for mounting a flat panel display in Fig. 5. However, Burris et al. do not

show or suggest an articulated arm with a 4-bar linkage, a piston inside the linkage, or an inter-arm locking mechanism, located on the two arms, which is adapted to lock the two arms together in a stowed position when the two arms are lowered in line with the direction of travel. The Examiner contends that the inter-arm locking mechanism is present in Burris et al., citing hinge 550 which joins arms 560 and 570 in Fig. 5 of Burris et al. While hinge may join the arms together, it certainly provides no locking ability. The circular arrow located above the center line of the hinge 550 shows exactly the opposite, the full swiveling range of hinge 550. The vertical arrow behind the hinge 550 indicates its range of vertical elevation. There is nothing in the text of Burris et al. which attributes any locking function to hinge 550.

The Examiner also contends that a vertical arrow in Fig. 5 of Burris et al. indicates a stowed position. Once again, there is no basis in Burris et al. for the Examiner's hypothesis. The text of Burris et al. says nothing at all about the arrows. From their positioning it is obvious that they are meant to indicate the motional range or direction of different parts and joints of the Burris et al. assemblies. The "stowed position" hypothesis was taken directly from applicants' Claim 1, as there is

This still leaves the 4-bar linkage arm and piston absent from Burris et al. To supply these, the Examiner cites Wilkins et al. which

shows a single-arm 4-bar linkage and piston to support and change the elevation of an ultrasound system control panel. The Wilkins et al. assembly enables a control panel to be moved vertically. The Wilkins et al. assembly lacks the full range of articulation of the two arm assembly of the present invention. Furthermore the Wilkins et al. assembly is for a heavy control panel. There is no suggestion to use the Wilkins et al. assembly for a much lighter flat panel display. In fact, Wilkins et al. teach away from use of their assembly with a flat panel display, as their ultrasound system plainly shows a flat panel display 16 in Fig. 1 with not the slightest suggestion to apply their control panel lift to the flat panel display. Hence it is respectfully submitted that Wilkins et al. teaches away from the combination with Burris et al. for which the Examiner contends.

For all of the foregoing reasons it is respectfully submitted that the control panel lift of Wilkins et al. cannot be combined with the flat panel articulation assemblies of Burris et al. Even if it could, the inter-arm locking mechanism for stowing the two arms when lowered in the direction of travel is completely absent from both patents.

Furthermore, the piston in the inventive flat panel articulation assembly is to counterbalance the weight of the display. In a constructed embodiment this counter-weight force occurs when the second arm is in a

horizontal orientation. See Claims 11 and 12. The piston 60 in Wilkins et al. is a hydraulic piston which provides no counterbalance for the weight of the control panel. Instead, when the hydraulic valve is closed, the piston supports the control panel at whatever its current elevation is. In addition to their dependency from Claim 1, it is respectfully submitted that Claims 11 and 12 are patentable over Burris et al. and Wilkins et al. for this further reason.

B. Whether Claim 6 was correctly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. 5,924,988 (Burris et al.) in view of US Pat. 6,663,569 (Wilkins et al.) and further in view of US Pat. 6,669,639 (Miller et al.)

Miller et al. was cited for its showing of a locking mechanism with a user operated lock release. Unlike the present invention, Miller et al. are articulating a heavy CRT monitor, not a flat panel display. Accordingly, the two arms of their assembly provide no adjustable elevation, only the ability to swivel the monitor about vertical axes. Two locking pins 50 are provided which can be used to lock the two swivel arms together, thus giving the option of operating the arms with two pivot points or three. This also enables the sizeable weight of the CRT monitor to be positioned over the center of the cart when the cart is moved. There are several significant differences with this assembly as compared with the inter-arm locking mechanism of Claim 1. In Miller et al. the arms do

not lock in a stowed position when lowered. The arms do not lower at all. One arm has a fixed elevation and the other is horizontal. Second, the two arms are not locked together. It is the joint that is immobilized by the pins so that it will not swivel. Finally, there is no stowed position when the two arms are lowered in line with the direction of travel. For all of these reasons it is respectfully submitted that the combination of Burris et al., Wilkins et al. and Miller et al. cannot render Claim 6 unpatentable due to its dependency from Claim 1.

VIII. CONCLUSION

Based on the law and the facts, it is respectfully submitted that Claims 1, 3-4 and 6-14 are patentable over any combination of Burris et al., Wilkins et al. and Miller et al. Accordingly, it is respectfully requested that this Honorable Board reverse the grounds of rejection of Claims 1, 3-4 and 6-14 of this application which were stated in the February 3, 2010 Office action being appealed.

Respectfully submitted,

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June 2, 2010

APPENDIX A: CLAIMS APPENDIX

The following Claims 1, 3-4 and 6-14 are the claims involved in this appeal.

1. (previously presented) An ultrasonic diagnostic imaging system comprising:

a main body housing imaging electronics and a control panel coupled to the imaging electronics;

a flat panel display electrically coupled to the imaging electronics;

a wheeled cart on which is mounted the main body and the flat panel display with the control panel on the front, the wheeled cart being adapted so that the cart can travel in the front direction; and

an articulating arm assembly to which the flat panel display is connected for adjusting the elevation and lateral position of the flat panel display with respect to the main body, the articulating arm assembly including a first arm movably mounted to the main body and a second arm movably connected to the first arm and to the flat panel display, wherein at least one of the arms includes a 4-bar linkage containing a piston inside the linkage; and

an inter-arm locking mechanism, located on the first and second arms, which is adapted to lock the two arms together in a stowed position when the two arms are lowered in line with the direction of travel.

2. (canceled)

3. (original) The ultrasonic diagnostic imaging system of Claim 1, wherein the second arm includes a 4-bar linkage.

4. (original) The ultrasonic diagnostic imaging

system of Claim 3, wherein the 4-bar linkage includes first and second pivot axes located at an end of the second arm which is connected to the first arm, and third and fourth pivot axes located at an end of the second arm which is connected to the flat panel display.

5. (canceled)

6. (previously presented) The ultrasonic diagnostic imaging system of Claim 1, wherein the locking mechanism further comprises a user-operated lock release which is operated to cause the locking of the two arms to be released.

7. (original) The ultrasonic diagnostic imaging system of Claim 1, wherein the articulating arm assembly further includes a first vertical pivot axis located at an end of the first arm which is movably mounted to the first body, and a second vertical pivot axis located at an end of the first arm which is connected to the second arm.

8. (original) The ultrasonic diagnostic imaging system of Claim 7, wherein the articulating arm assembly further includes a third vertical pivot axis located at an end of the second arm which is connected to the flat panel display, and a horizontal pivot axis located at the end of the second arm which is connected to the flat panel display.

9. (original) The ultrasonic diagnostic imaging system of Claim 7, wherein the arc of travel of the first arm about the first vertical pivot axis is constrained to be less than 360°, and wherein the arc of travel of the second arm about the second vertical axis is constrained to be less than 360°.

10. (previously presented) The ultrasonic

diagnostic imaging system of Claim 1, wherein the second arm includes a 4-bar linkage, and wherein the piston further comprises:

 a pneumatic piston which acts to provide a force which at least partially offsets the weight of the flat panel display.

11. (original) The ultrasonic diagnostic imaging system of Claim 10, further comprising an adjustment mechanism, coupled to the pneumatic piston, which is operable to adjust the force provided by the pneumatic piston.

12. (original) The ultrasonic diagnostic imaging system of Claim 11, wherein the pneumatic piston is adjusted to provide a balancing counter-weight force when the second arm is oriented in a horizontal orientation.

13. (original) The ultrasonic diagnostic imaging system of Claim 1, wherein the first arm exhibits a fixed upward inclination from an end which is connected to the main body to a second end which is elevated above the connection to the main body, and the second arm includes a 4-bar linkage.

14. (original) The ultrasonic diagnostic imaging system of Claim 3, wherein the 4-bar linkage includes first and second upper bars coupled between the first and third pivot axes and third and fourth lower bars coupled between the second and fourth pivot axes,

 wherein the first bar is rigidly connected to the second bar and the third bar is rigidly connected to the fourth bar.

15. - 20. (canceled)

APPENDIX B: EVIDENCE APPENDIX

None. No extrinsic evidence has been submitted in this case.

APPENDIX C: RELATED PROCEEDINGS APPENDIX

None. There are no related proceedings.